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**Deperro et al.**

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(54) **SYSTEMS AND METHODS FOR PROVIDING REAL-TIME MONITORING OF SPENDING LIMITS**

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**G06Q 50/00** (2012.01)

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CPC ..... **G06Q 40/06** (2013.01); **G06Q 50/01** (2013.01)

(58) **Field of Classification Search**  
USPC ..... 705/36, 36 R  
See application file for complete search history.

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(57) **ABSTRACT**

In one embodiment, a server is provided for providing real-time monitoring of spending limits. The server may include memory storing software instructions, and a processor(s) configured to execute the software instructions to perform operations. The operations may include determining that a user has interacted with a store item in a retail environment. The operations may also include accessing a user profile of the user that includes a savings goal of the user, and determining that purchase of the store item would meet at least one trigger condition associated with the savings goal. The operations may further include generating an analysis of the estimated impact of the purchase to the savings goal, and providing the analysis to a device for display to the user while the user remains within the retail environment.

**14 Claims, 10 Drawing Sheets**

USER PICKS UP STORE ITEM MONITORING PROCESS 500



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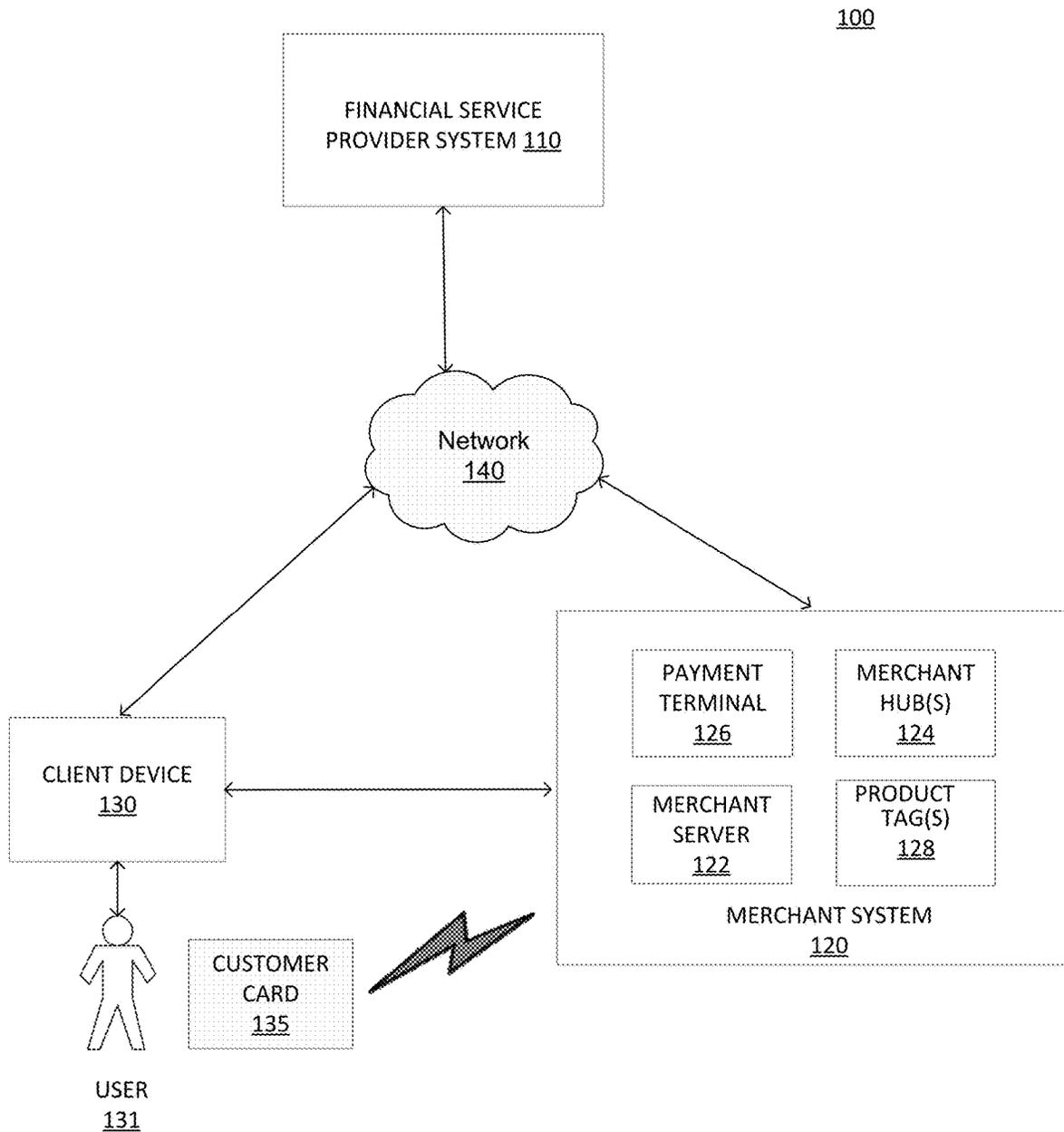


FIGURE 1

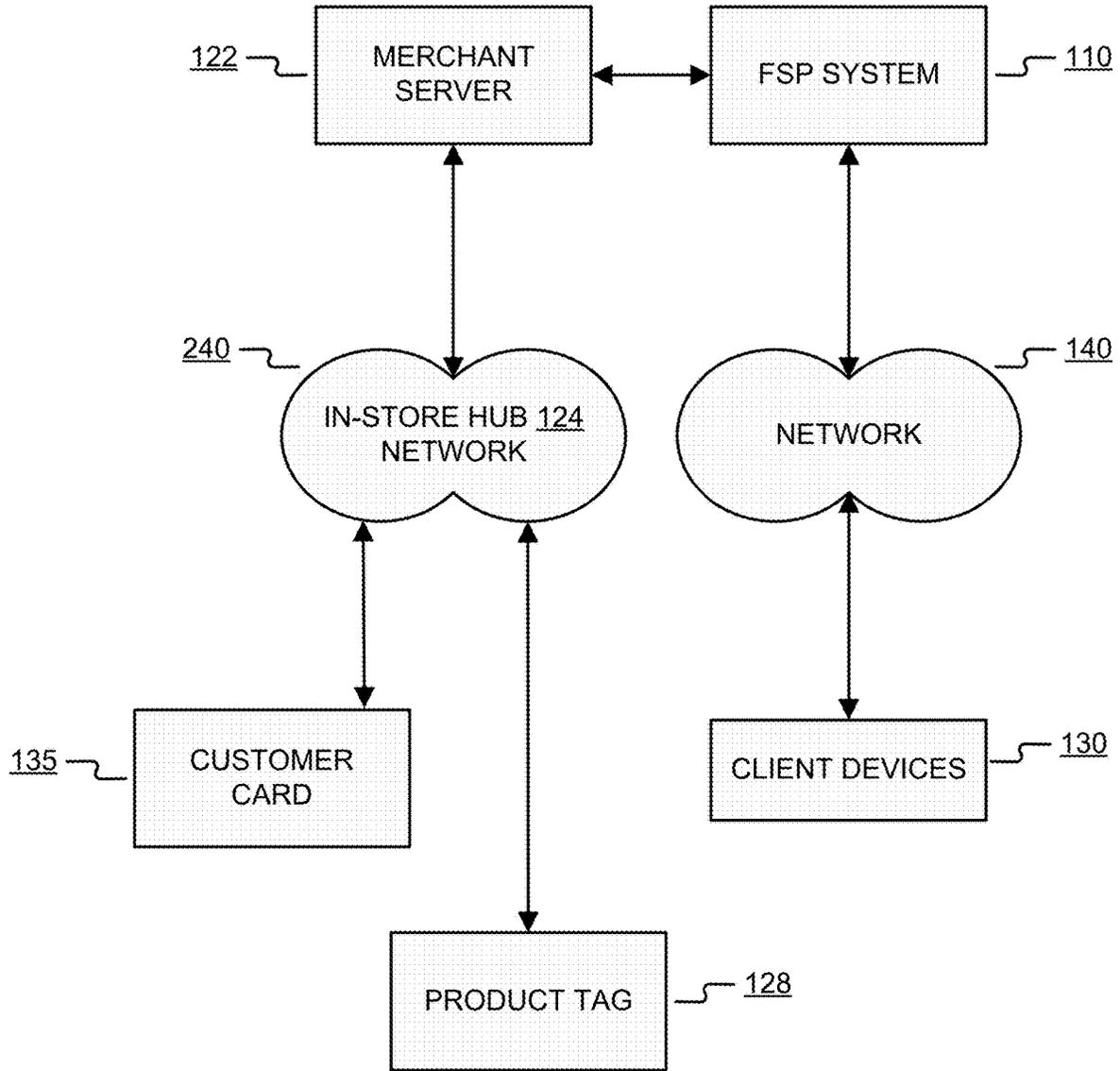


FIGURE 2

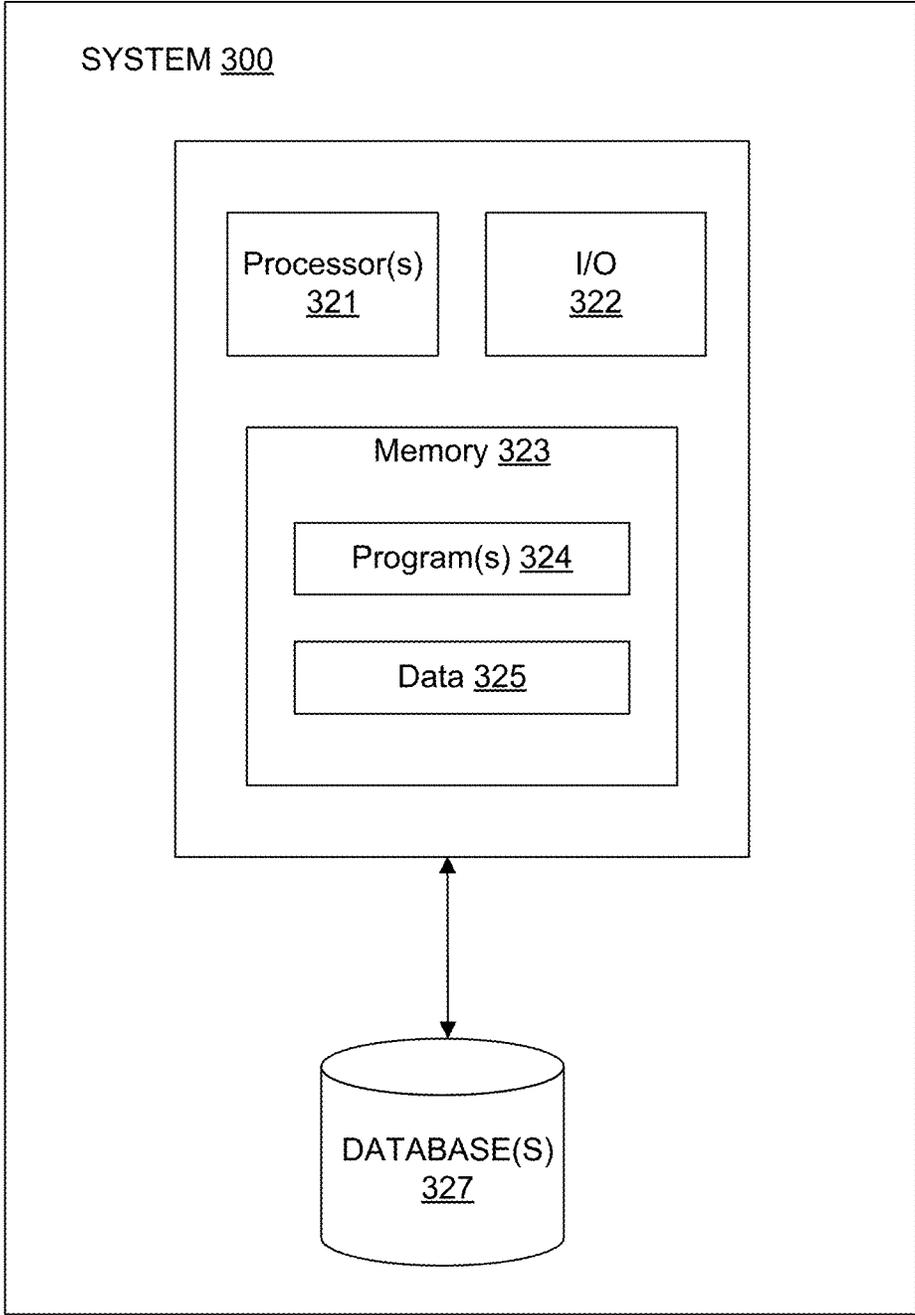


FIGURE 3

REAL-TIME MONITORING  
PROCESS 400

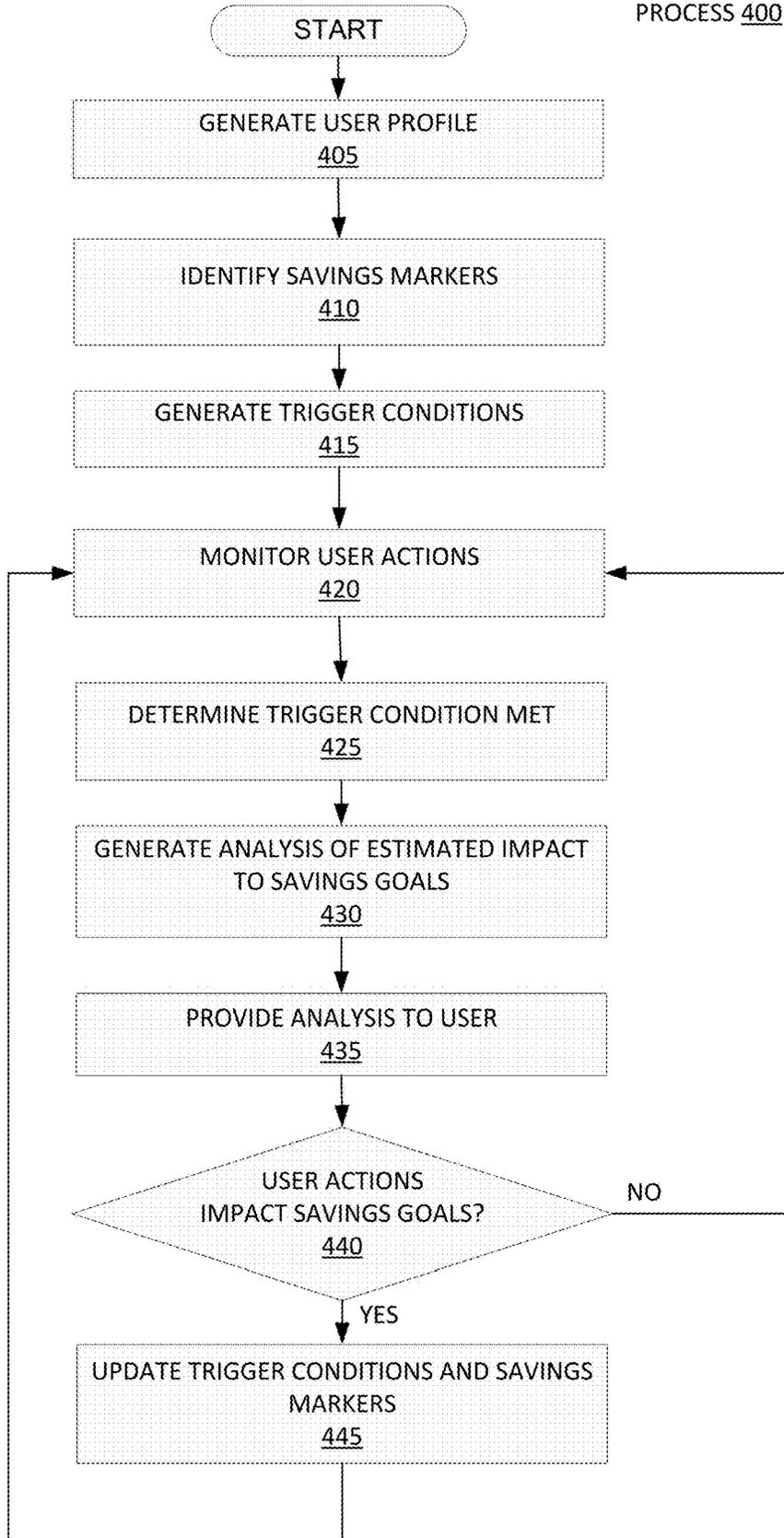


FIGURE 4

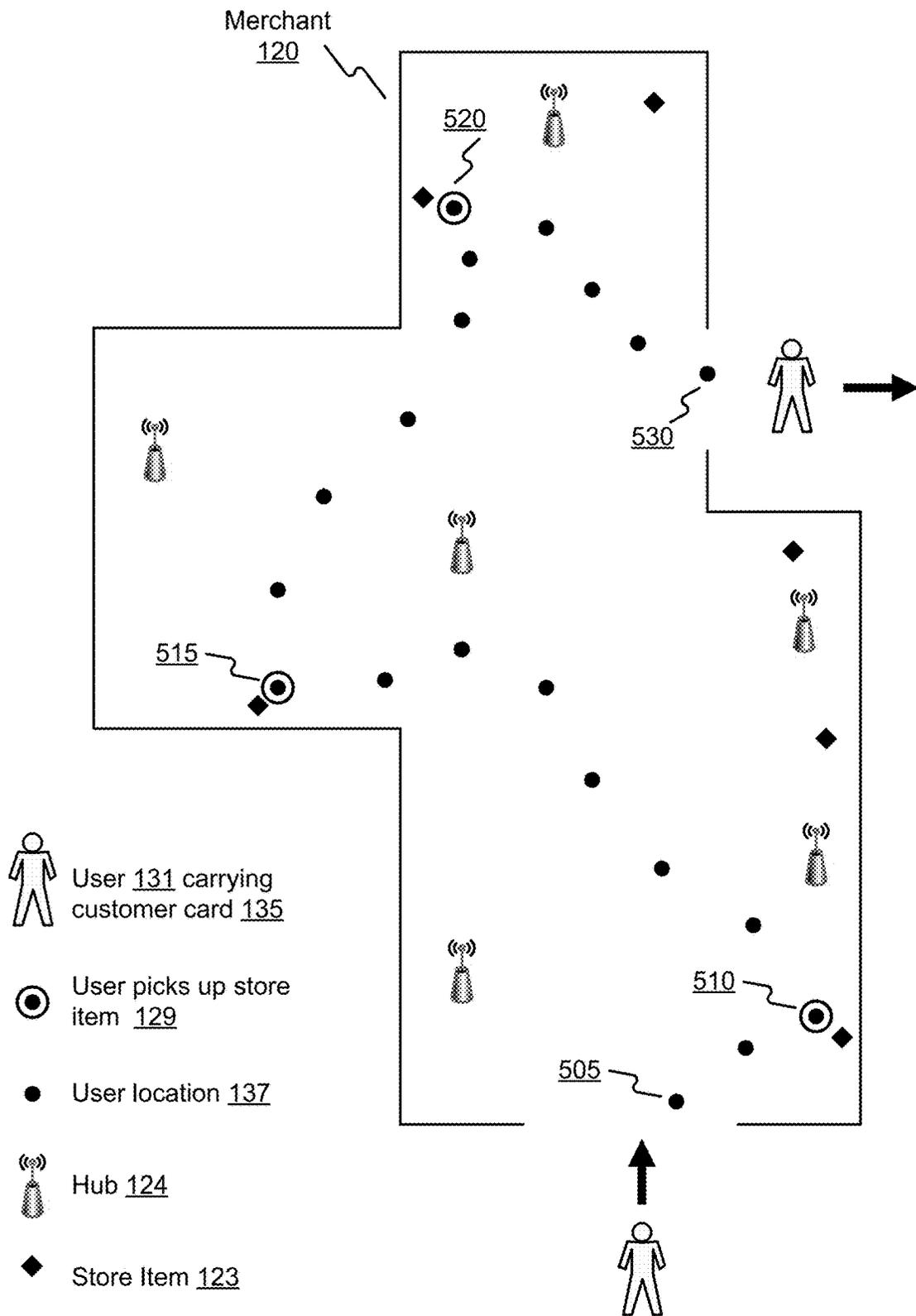


FIGURE 5

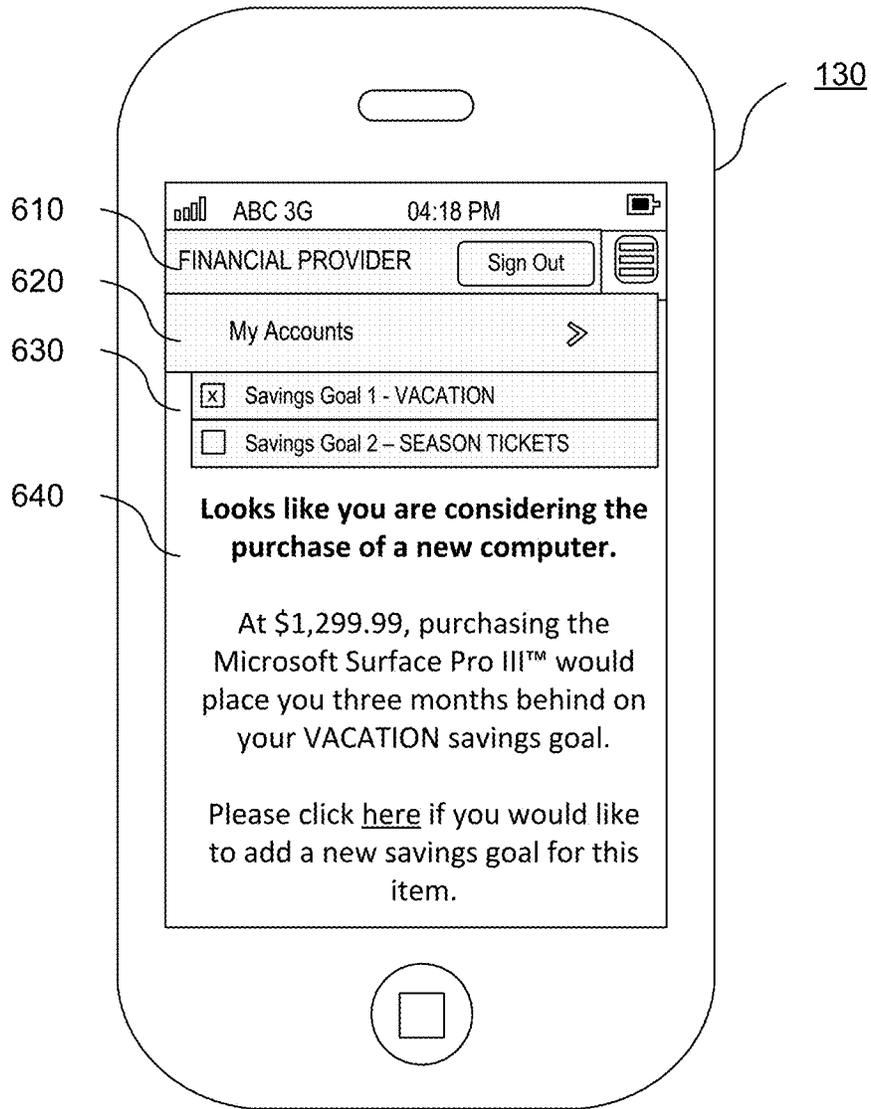


FIGURE 6

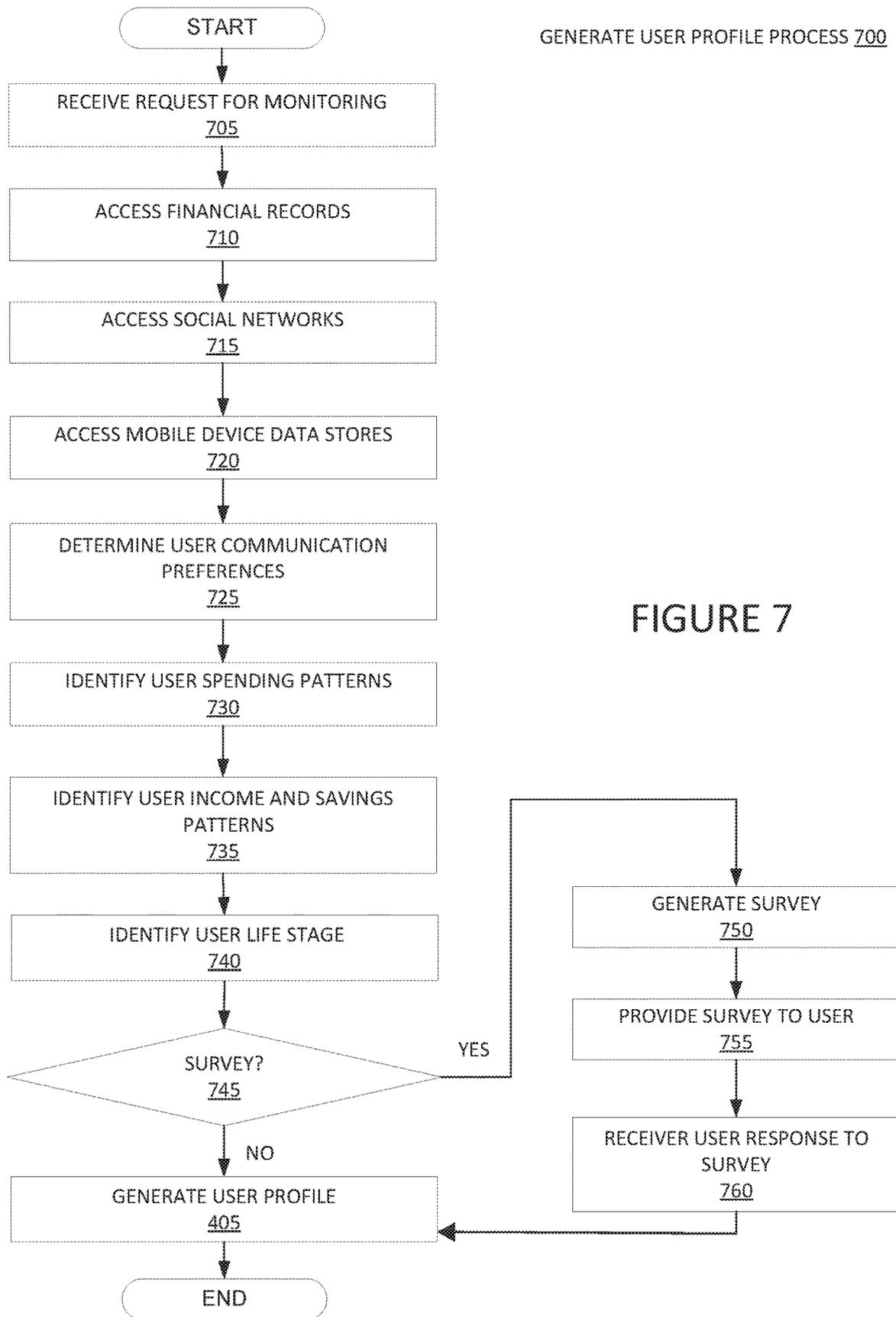


FIGURE 7

USER ENTERING STORE  
MONITORING PROCESS 800

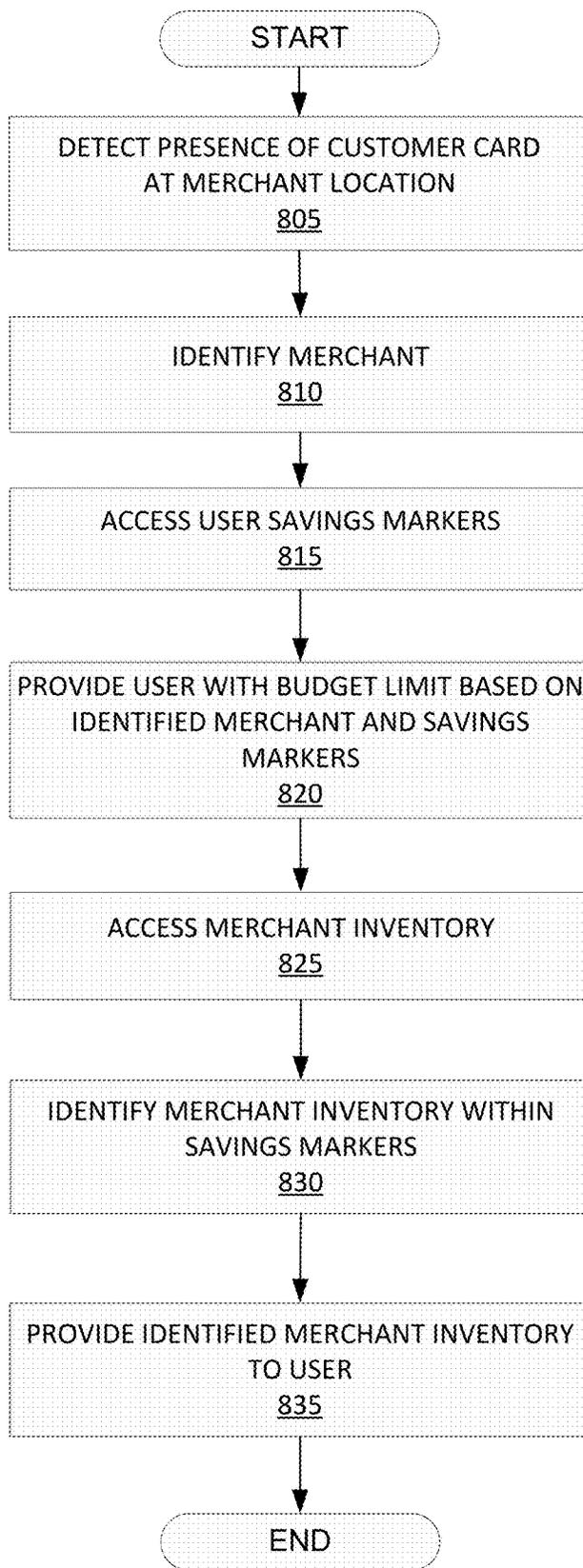


FIGURE 8

USER PICKS UP STORE TIME  
MONITORING PROCESS 900

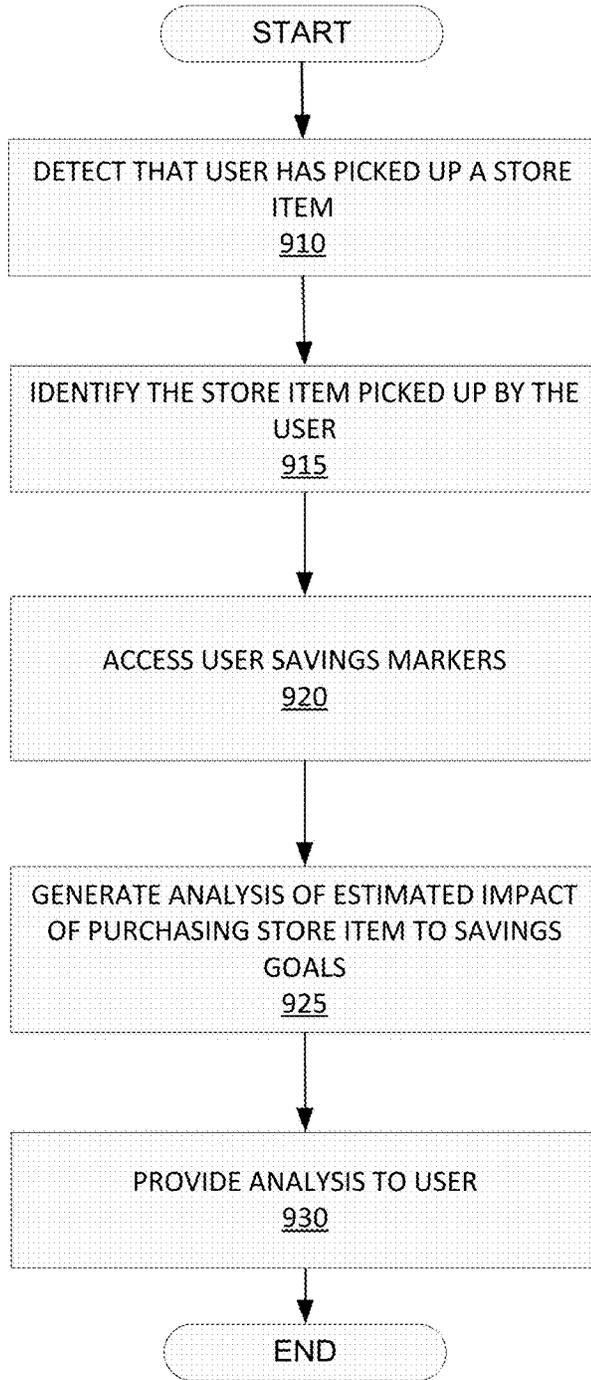


FIGURE 9

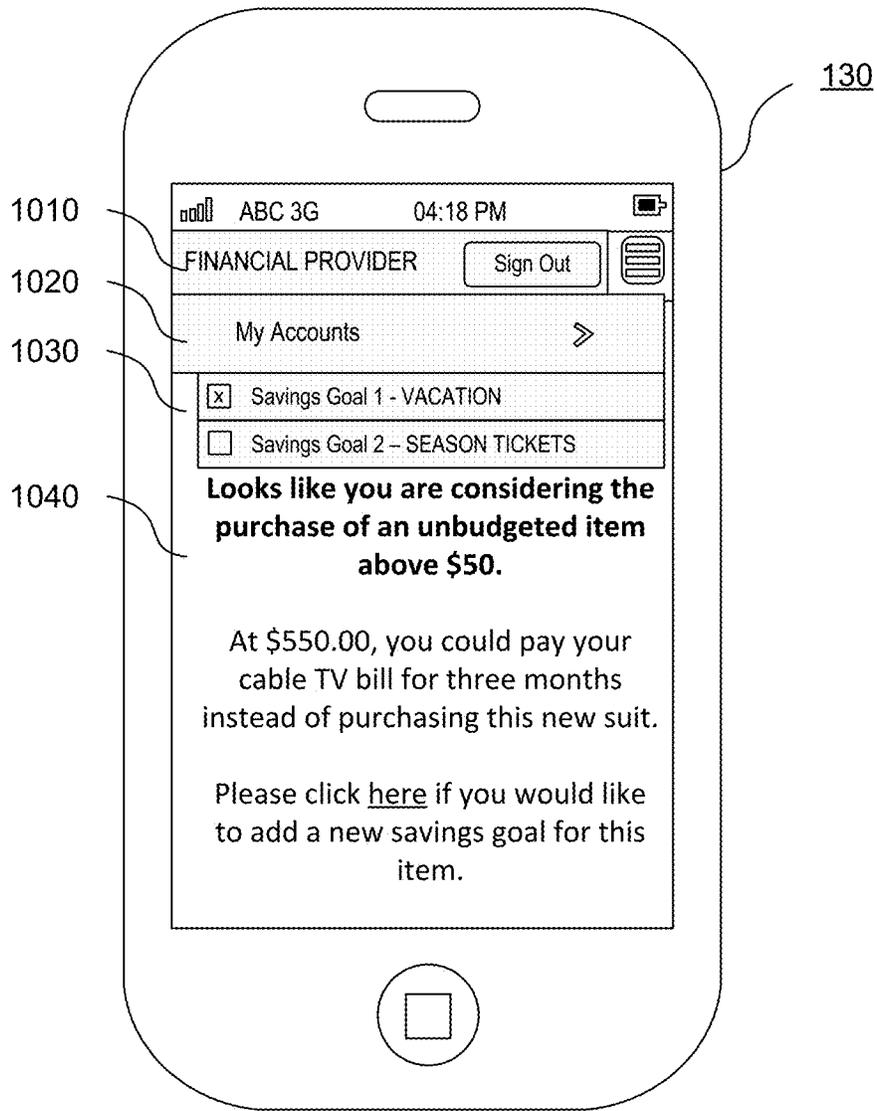


FIGURE 10

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## SYSTEMS AND METHODS FOR PROVIDING REAL-TIME MONITORING OF SPENDING LIMITS

### PRIORITY

This application claims priority to U.S. Provisional Application No. 62/094,747 filed Dec. 19, 2014, the disclosure of which is hereby incorporated by reference in its entirety.

### BACKGROUND

Typical budget and money management systems allow users to view their savings goals and current spending habits, but these systems offer only high-level goals and insights after users have already made their spending decisions. For example, current systems allow a user to review their past purchases from the previous billing cycle of expenses, and the category of spending those purchases fell into, but only in the context of how past purchases have affected the user's savings goals.

Current systems do not provide a user with personalized budgeting advice at a time when receiving the advice could alter spending priorities while the user remains within a retailer environment, before making a purchase. For example, current systems cannot provide a user with real-time analyses estimating the impact that a purchase of a store item the user has "in hand" at the store would have on the user's financial goals, while the user is still holding onto the store item. Current systems also fail to provide analyses in a context that allows the user to make decisions in the context of the user's desired lifestyle. For example, current systems do not provide users with personalized cost metaphors or suggest a future purchase that the user typically makes but could forgo in order to purchase the item "in hand" while still achieving the user's savings goals.

Current computing systems and supporting infrastructures are ill-equipped to address these and similar issues. Therefore, the computing systems disclosed herein are directed towards, among other things, providing financial analyses to users in real-time to allow a user to consider, before making a purchase, what impact making the purchase would have on the user's savings goals.

### SUMMARY

Disclosed embodiments include methods, systems, and computer-readable media configured to, for example, provide real-time monitoring of spending limits. The disclosed embodiments may be configured to provide users the ability to consider the impact of a purchase to the user's savings goals before making the purchase. Disclosed embodiments may further provide an analysis to the user of the estimated impact of a purchase to the user's savings goals, as well as suggestions for lessening and/or avoiding the estimated impact if the user makes the purchase.

The disclosed embodiments may also include a server for providing real-time monitoring of spending limits. The server may comprise a memory storing software instructions, the software instructions including an application configured to perform operations. The server may also include one or more processors configured to execute the software instructions to perform operations. The operations may include determining a user has interacted with a store item within a retail environment. The operations may further include accessing a user profile of the user, the user profile including at least one savings goal of the user, and deter-

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mining that a purchase of the store item would meet at least one trigger condition from among a plurality of trigger conditions associated with the at least one savings goal. The operations may also include generating an analysis of the estimated impact of the purchase on the at least one savings goal, and providing the analysis to a device for display to the user while the user remains within the retail environment.

Aspects of the disclosed embodiments may include tangible computer-readable media that stores software instructions that, when executed by one or more processors, are configured to and capable of performing and executing one or more of the methods, operations, and the like consistent with the disclosed embodiments. Also, aspects of the disclosed embodiments may be performed by one or more processors that are configured as special-purpose processor(s) based on software instructions that are programmed with logic and instructions that perform, when executed, one or more operations consistent with the disclosed embodiments.

It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the disclosed embodiments, as claimed.

### BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate disclosed embodiments and, together with the description, serve to explain the disclosed embodiments. In the drawings:

FIG. 1 is a block diagram of an exemplary system, consistent with disclosed embodiments.

FIG. 2 is an exemplary network architecture, consistent with disclosed embodiments.

FIG. 3 is a diagram of another exemplary system, consistent with disclosed embodiments.

FIG. 4 is a flow chart of an exemplary real-time monitoring process, consistent with disclosed embodiments.

FIG. 5 is an exemplary retail environment, consistent with disclosed embodiments.

FIG. 6 is a diagram of an exemplary interface displaying an exemplary analysis on a client device, consistent with disclosed embodiments.

FIG. 7 is a flow chart of an exemplary user profile generation process, consistent with disclosed embodiments.

FIG. 8 is a flow chart of an exemplary user entering store monitoring process, consistent with disclosed embodiments.

FIG. 9 is a flow chart of an exemplary user monitoring process, consistent with disclosed embodiments.

FIG. 10 is another diagram of an exemplary interface displaying an exemplary analysis on a client device, consistent with disclosed embodiments.

### DETAILED DESCRIPTION

Reference will now be made in detail to the disclosed embodiments, examples of which are illustrated in the accompanying drawings. Wherever convenient, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

FIG. 1 is a block diagram of an exemplary system 100 for performing one or more operations consistent with the disclosed embodiments. In one embodiment, system 100 may include one or more financial service provider (FSP) systems 110, one or more merchant systems 120, one or more client devices 130, one or more customer cards 135, and network 140. The components and arrangement of the components included in system 100 may vary. Thus, system

**100** may include other components that perform or assist in the performance of one or more processes consistent with the disclosed embodiments.

Components of system **100** may be configured to provide real-time monitoring of spending limits, consistent with disclosed embodiments. As further described herein, merchant system **120** may track the location of a user **131** (e.g., by tracking the location of customer card **135** carried by user **131**) and report a customer's interaction with a store item of the merchants to FSP **110**. FSP **110** may access a user profile of user **131** and provide the user with an analysis (e.g., by sending the analysis for display on client device **130** operated by user **131**) of whether purchasing the store item is consistent with the user's short- and/or long-term savings goals.

Components of system **100** may include one or more computing devices (e.g., computer(s), server(s), etc.), memory storing data and/or software instructions (e.g., database(s), memory devices, etc.), and other known computing components. In some embodiments, the one or more computing devices may be configured to execute software instructions stored on one or more memory devices to perform one or more operations consistent with the disclosed embodiments. Other components of system **100**, such as product tag(s) **128** and customer card **135**, may include passive components having no internal power source. FSP system(s) **110**, merchant system(s) **120**, and client(s) **130** may be configured to communicate with one or more other components of system **100**. In certain aspects, users may operate one or more components of system **100** to receive communications, initiate operations, and/or provide input for one or more operations consistent with the disclosed embodiments.

FSP system **110** may be associated with a financial service entity that provides, maintains, manages, or otherwise offers financial services. For example, the financial service entity may be a bank, credit card issuer, or any other type of financial service entity that generates, provides, manages, and/or maintains financial service accounts for one or more users. Financial service accounts may include, for example, credit card accounts, loan accounts, checking accounts, savings accounts, reward or loyalty program accounts, and/or any other type of financial service account known to those skilled in the art. FSP system **110** may include infrastructure and components that are configured to generate and/or provide financial service accounts such as credit card accounts, checking accounts, debit card accounts, loyalty or reward programs, lines of credit, and the like.

In one aspect, FSP system **110** may be one or more computing devices configured to perform one or more operations consistent with disclosed embodiments. In one aspect, FSP system **110** may be one or more servers. FSP system **110** may include one or more processors configured to execute software instructions stored in memory. The one or more processors may be configured to execute software instructions that, when executed by a processor, performs Internet-related communication, financial service-based processes, and/or spending limit monitoring processes. For instance, FSP system **110** may execute software that provides data used for generating and displaying interfaces, including content for a display device included in, or connected to, client device **130**. In some embodiments, financial service provider **110** may provide one or more web sites or online portals that are accessible by client device **130** and/or merchant system **120** over network **140**. The disclosed embodiments are not limited to any particular configuration of FSP system **110**.

Merchant system **120** may be an entity that offers goods, services, and/or information, such as a retailer (e.g., Macy's®, Target®, etc.), grocery store, or any other type of entity that offers goods and/or services that consumers may purchase. In one example, merchant system **120** may be associated with a merchant brick and mortar location(s) that a consumer (e.g., a user of client device **130**) may physically visit to purchase a product or service. Merchant system **120** may also include back- and/or front-end computing components that store data and execute software instructions to perform operations consistent with disclosed embodiments, such as computers that are operated by employees of the merchant (e.g., back office systems, etc.).

Merchant system **120** may include one or more merchant servers **122**, payment terminals **126**, merchant hubs **124**, and product tags **128**. Merchant servers **122** may include one or more computing systems configured to execute stored software instructions to perform operations associated with a merchant, including one or more processes associated with processing purchase transactions, generating transaction data, generating product data (e.g., SKU data) relating to purchase transactions, etc.

Merchant hub(s) **124** may include one or more computing systems configured to execute stored software instructions to perform operations associated with monitoring customer interactions with store items within a merchant store. For example, merchant hub(s) **124** may be configured to monitor the location of customer card **135** carried by user **131** and product tag(s) **128** affixed to store items within a merchant store and determine when a customer has interacted with the store item, such as by picking up the store item.

Payment terminal **126** may be one or more computing devices configured to perform one or more operations consistent with conducting sales transactions associated with merchant system **120**. For example, payment terminal **126** may comprise one or more point-of-sale (POS) terminals configured to accept payment from user **131** associated with the sale of a merchant store item.

Product tag(s) **128** may comprise one or more components detectable by merchant hub(s) **124** that may be affixed to store items. For example, product tag(s) **128** may comprise a label that includes technology to allow merchant hub(s) **124** to track the location of the product tag(s) **128** within a retail environment including technology associated with using, for example, near field communication (NFC), RFID, infrared, electric fields, magnetic fields, WiFi, Bluetooth, etc. In some embodiments, product tag(s) **128** may be a passive, low-power device having no internal power source.

Client device **130** may be one or more computing devices configured to perform one or more operations consistent with disclosed embodiments. In some embodiments, client device **130** may be a mobile device (e.g., tablet, smart phone, etc.). Client device **130** may include one or more processors configured to execute software instructions stored in memory, such as memory included in client device **130**. Client device **130** may include software that when executed by a processor performs known Internet-related communication, content display processes, and financial service-related processes for a user of client device **130**. For instance, client device **130** may execute browser or related mobile display software that generates and displays interfaces including content on a display device included in, or in communication with, client device **130**. Client device **130** may be a mobile device that executes mobile device applications and/or mobile device communication software that allows client device **130** to communicate with components

over network 140, and generates and displays content in interfaces via a display device included in client device 130. The disclosed embodiments are not limited to any particular configuration of client device 130. For instance, client device 130 may be a mobile device that stores and executes

mobile applications that provide financial service-related functions offered by the financial service entity associated with FSP system 110, such as a mobile banking application for checking balances, paying bills, performing financial transactions, budgeting, receiving marketing messages, etc. Customer card 135 may comprise a financial services product associated with financial service accounts of user 131, such as a financial card, key fob, smartcard, etc. For example, customer card 135 may comprise a credit card, debit card, or any other financial card associated with conducting financial transactions. In some embodiments, customer card 135 may comprise a digital wallet such that, for example, client device 130 is customer card 135. In some embodiments, customer card 135 may include technology to allow merchant hub(s) 124 to track the location of the customer card 135 within a retail environment including technology associated with using, for example, near field communication (NFC), RFID, infrared, electric fields, magnetic fields, WiFi, Bluetooth, etc. In other embodiments, a component may be affixed to customer card 135 in order to allow merchant hub(s) 124 to track the location of the customer card 135 within a retail environment. In some embodiments, customer card 135 may be a passive, low-power device having no internal power source.

Network 140 may be any type of network configured to provide communications between components of system 100. For example, network 140 may be any type of network (including infrastructure) that provides communications, exchanges information, and/or facilitates the exchange of information, such as the Internet, a Local Area Network, NFC, Optical code scanner, or other suitable connection(s) that enables the sending and receiving of information between the components of system 100. In other embodiments, one or more components of system 100 may communicate directly through a dedicated communication link(s).

It is to be understood that the configuration and boundaries of the functional building blocks of system 100 have been defined herein for the convenience of the description. Alternative boundaries can be defined so long as the specified functions and relationships thereof are appropriately performed. Alternatives (including equivalents, extensions, variations, deviations, etc., of those described herein) will be apparent to persons skilled in the relevant art(s) based on the teachings contained herein. Such alternatives fall within the scope and spirit of the disclosed embodiments.

FIG. 2 shows an exemplary network architecture, consistent with disclosed embodiments. As further described herein, merchant system 120 may track the location of a user (e.g., by tracking the location of customer card 135 carried by user 131) and a plurality of store items 123 (e.g., by tracking the location of product tags 128 affixed to store items 123). For example, merchant system 120 may comprise one or more hubs 124 that communicate with and/or track the location of customer card 135 and product tags 128 over an in-store hub network 240 generated by the one or more hubs 124. In-store network 240 may comprise near field communication (NFC), RFID, infrared, electric fields, magnetic fields, WiFi, Bluetooth, or any other wireless technology suitable for performing operations consistent with disclosed embodiments. Hub(s) 124 may determine that a customer has interacted with a store item 123 when

customer card 135 and a product tag 128 become linked. In one example, hub(s) 124 may determine customer card 135 and a product tag 128 are linked based on a determination that customer card 135 and product tag 128 are within a predetermined proximity of each other. For example, hub(s) 124 may determine that customer card 135 and product tag 128 are within 10 inches of each other, indicating that the user has picked up store item 123. In other examples, hub(s) 124 may generate an electrical field, and hub(s) 124 may determine customer card 135 and product tag 128 are linked based on changes to the electrical field with respect to customer card 135 and store item 123 caused by user 131 touching store item 123. According to some embodiments, hub(s) 124 may communicate with merchant server 122 over a Local Area Network (LAN) or direct connection separate from in-store hub network 240.

Upon a determination that user 131 has interacted with store item 123, hub(s) 124 may transmit information associated with customer card 135 and store item 123 (identified by merchant system 120 from product tag 128) to FSP system 110 via, e.g., merchant server 122. FSP system 110 may identify user 131 based on the customer card 135 information and access a user profile of user 131 associated with customer card 135 to identify one or more savings goals of the user. As discussed more fully herein, FSP system 110 may also conduct an analysis of whether the purchase of store item 123 is consistent with the one or more savings goals of the user.

FSP system 110 may also provide the analysis to client device 130 in real-time such that user 131 is provided the analysis in time for user 131 to consider, before making a purchase, what impact purchasing store item 123 would have to the one or more savings goals. FSP system 110 may provide the analysis to client device 130 over network 140 according to the user's communication preferences, which may be indicated in the user profile of user 131. For example, user 131 may prefer to receive budget analyses via SMS messages at the user's cellular phone (client device 130, in this example), and FSP 110 may provide the analysis to the user's cellular phone over a cellular network (network 140, in this example).

FIG. 3 shows an exemplary system 300 consistent with disclosed embodiments. Variations of exemplary system 300 may be one or more components of FSP system 110, merchant system 120, and/or client device 130. In one embodiment, system 300 may comprise one or more processors 321, one or more input/output (I/O) devices 322, and one or more memories 323. In some embodiments, system 300 may take the form of a server, general purpose computer, mainframe computer, or any combination of these components. In some embodiments, system 300 may take the form of a mobile computing device (e.g., client device 130) such as a smartphone, tablet, laptop computer, or any combination of these components. Alternatively, system 300 may be configured as a particular apparatus, embedded system, dedicated circuit, and the like based on the storage, execution, and/or implementation of the software instructions that perform one or more operations consistent with the disclosed embodiments.

Processor 321 may include one or more known processing devices, such as a microprocessor from the Pentium™ or Xeon™ family manufactured by Intel™, the Turion™ family manufactured by AMD™ or any of various processors manufactured by Sun Microsystems. The disclosed embodiments are not limited to any type of processor(s) otherwise configured to meet the computing demands required of different components of system 100. For example, processor

321 may also include one or more mobile device microprocessors when a variation of system 300 is client device 130.

Memory 323 may include one or more storage devices configured to store instructions used by processor 321 to perform functions related to disclosed embodiments. For example, memory 323 may be configured with one or more software instructions, such as program(s) 324 that may perform one or more operations when executed by processor 321. The disclosed embodiments are not limited to separate programs or computers configured to perform dedicated tasks. For example, memory 323 may include a single program 324 that performs the functions of system 300, or program 324 may comprise multiple programs. Memory 323 may also store data 325 that is used by one or more programs 324.

In certain embodiments, memory 323 may store software associated with providing real-time monitoring of spending limits that may be executed by processor(s) 321 to perform one or more communication and/or analysis processes consistent with disclosed embodiments. For example, the software may be run by a FSP system 110, merchant system 120, and/or client device 130 to provide a private label financial account held by a consumer.

I/O devices 322 may be one or more devices configured to allow data to be received and/or transmitted by system 300. I/O devices 322 may include one or more digital and/or analog devices that allow system 300 to communicate with and/or detect other machines and devices, such as other components of system 100. For example, when system 300 is FSP system 110 or merchant system 120, I/O devices 322 may include a network controller and/or wireless adaptor for communicating over the Internet. Further, in some embodiments, merchant system 120 may include one or more hubs 124 having I/O devices 322 configured to generate an electric field for tracking the location of and/or communicating with customer card(s) 135 and product tag(s) 128.

In some embodiments, I/O devices 322 may include a screen for displaying an interface. I/O devices 322 may also include one or more digital and/or analog devices that allow a user to interact with system 300 such as a touch-sensitive area, keyboard, buttons, or microphones. I/O devices 322 may also include other components known in the art for interacting with a user.

The components of system 300 may be implemented in hardware, software, or a combination of both hardware and software, as will be apparent to those skilled in the art. For example, although one or more components of system 300 may be implemented as computer processing instructions, all or a portion of the functionality of system 300 may be implemented instead in dedicated electronics hardware.

System 300 may also be communicatively connected to one or more database(s) 327. System 300 may be communicatively connected to database(s) 327 through network 140. Database 327 may include one or more memory devices that store information and are accessed and/or managed through system 300. By way of example, database(s) 327 may include Oracle™ databases, Sybase™ databases, or other relational databases or non-relational databases, such as Hadoop sequence files, HBase, or Cassandra. The databases or other files may include, for example, data and information related to the user profiles, savings goals, trigger conditions associated with those savings goals, financial records, purchase transaction data, consumer demographics information, etc. Systems and methods of disclosed embodiments, however, are not limited to separate databases. In one aspect, system 300 may include database 327. Alternatively, database 327 may be located

remotely from the system 300. Database 327 may include computing components (e.g., database management system, database server, etc.) configured to receive and process requests for data stored in memory devices of database(s) 327 and to provide data from database 327.

FIG. 4 shows a flowchart of an exemplary real-time monitoring of spending limits process 400, consistent with disclosed embodiments. According to some embodiments, process 400 may be employed to generate a user profile having savings goals for user 131, monitor actions of user 131 when in a retail environment, and provide user 131 with a spending analysis in time for user 131 to consider, before making a purchase, what impact purchasing a store item 123 would have on user 131 savings goals.

In step 405, FSP system 110 may generate a user profile for user 131, as described in more detail with respect to FIG. 7. At step 410, FSP system 110 may identify savings markers for user 131. For example, FSP system 110 may identify that user 131 saves \$350 per month and takes one vacation per year that on average costs \$4,000. In another example, FSP system 110 may receive input from user 131 (via, e.g., client device 130) identifying the savings markers.

At step 415, FSP system 110 may generate trigger conditions associated with the savings markers. For example, the trigger conditions may establish when to communicate with user 131 regarding one or more savings goals of the user. Thus, continuing the above example, a trigger condition may be generated to send a message to user 131 when the user interacts with a store item whose purchase would cause user 131 to save less than \$350 per month. Thus, if user 131 picks up an expensive item within a retailer environment, FSP system 110 may send a message to client device 130 informing the user 131 that purchasing the expensive item would cause user 131 to save only \$250 that month if user 131 follows his or her typical spending patterns. In another example, a trigger condition may be generated when user 131 enters a retailer environment to communicate user 131's remaining budget for the category of spending most associated with the retailer's business. Thus, if user 131 enters a grocery store, FSP system 110 may send a message to client device 130 informing the user 131 that \$50 remains in user 131 grocery budget until user 131's next pay period.

At step 420, FSP system 110 may monitor actions of user 131 via, e.g., communications received from merchant system 120. In some embodiments, merchant system 120 may include one or more hubs 124 monitoring the presence and location of a customer card 135 carried by user 131 and a plurality of product tags 128 affixed to store items within the retail environment associated with merchant system 120. For example, consistent with disclosed embodiments, hub(s) 124 may determine that user 131 entered the store, stood in front of a particular set of products for a predetermined amount of time, and/or interacted with the store item. Such determinations by hub(s) 124 may be forwarded to FSP system 110 (via, e.g., merchant server 122) for use in monitoring user 131's actions. Additionally or alternatively, FSP system may receive a communication from client device 130 (either directly or indirectly via, e.g., merchant server 122) indicating that user 131 operated client device 130 to scan a machine-readable code (e.g., barcode, QR code, etc.) affixed to the store item.

At step 425, FSP system 110 may determine that one or more trigger conditions associated with the user profile of user 131 are met by user 131's actions. For example, upon finding that user 131 entered a restaurant for a third time in one work week, FSP system 110 may determine a trigger condition has been met associated with a savings marker

limiting user **131** to going out for lunch no more than two times per work week. In another example, upon finding that user **131** picked up a \$500 product at a retailer store, FSP system **110** may determine a trigger condition has been met associated with a savings marker that excludes unbudgeted purchases over \$300.

At step **430**, FSP system **110** may generate an analysis of the estimated impact of user **131**'s actions on the savings goals of user **131**. In some embodiments, such as when a trigger condition is met when user **131** walks into a retail store, the analysis may be the remaining budget available in the merchant category associated with the retail store. In other embodiments, such as when user **131** picks up an store item within the retail environment, the analysis may include a determination that the purchase of the store item picked up would meet a trigger condition, such as exceeding a spending limit indicated in savings markers associated with the user profile of user **131**. FSP system **110** may further generate an analysis that includes suggested alternatives to the picked up store item, including alternative store items found within the same retail environment. In one example, the analysis may include a personalized cost metaphor comparing the cost of the store item picked up by user **131** to one or more regular expenses of the user. For example, if the user interacted with a power tool costing \$400, FSP system **110** may generate an analysis that notes the purchase of the power tool equates to four months' worth of cable TV bills. In yet another example, the analysis could include suggestions for modifying the typical spending habits of user **131** to allow user **131** to purchase the picked up store item without impacting user **131**'s savings goals. For example, if user **131**'s spending habits include attending a baseball game three times per month at a cost of \$30 per ticket, FSP system **110** may generate an analysis that reflects that user **131** may skip one month of baseball games in order to purchase a \$90 pair of dress shoes whose purchase would otherwise exceed a spending limit.

In step **435**, FSP system **110** may provide the analysis to user **131** in real-time. FSP system **110** may provide the analysis to user **131** by means of a push notification within a mobile device software application provided by the financial service entity associated with FSP system **110** installed on client device **130**. Additionally or alternatively, FSP system **110** may provide the analysis via SMS message, e-mail, or any other real-time messaging system. In some embodiments, FSP system **110** may access the user profile of user **131** to identify user **131**'s communication preferences and provide the analysis according to the user **131**'s preferred method.

At step **440**, FSP system **110** may determine whether the user's actions (including, e.g., actions occurring after the determination that user **131**'s actions met a trigger condition) will impact user **131**'s savings goals. For example, FSP system **110** may determine that user **131** made a purchase, which may reduce the budget available according to one or more spending goals of user **131**. In another embodiment, FSP system **110** may find that user **131** returned a store item to the shelf without purchasing it, thus having no impact on the savings goals of user **131**. When FSP system **110** determines the actions of user **131** do not impact the savings goals of user **131** (step **440**; NO), FSP system **110** may continue to monitor actions of user **131** via, e.g., communications received from merchant system **120**. When FSP system **110** determines the actions of user **131** do impact the savings goals of user **131** (step **440**; YES), FSP system **110** may continue to step **445**.

At step **445**, FSP system **110** may update trigger conditions and savings markers based on the action taken. For example, FSP system **110** may reduce the remaining budget available for groceries when user **131** purchases groceries. FSP system **110** may determine that user **131** has made a purchase by authorizing a financial transaction requested by merchant system **120** to fund a purchase of one or more store items from user **131**'s financial account with the financial service entity. Additionally or alternatively, FSP system **110** may determine that user **131** has made a purchase when merchant system **120** communicates with FSP system **110** that payment terminal **126** processed the purchase of one or more store items by user **131**. In other embodiments, FSP system **110** may determine that user **131** made a purchase despite receiving an analysis that the purchase exceeded certain speeding limits, and FSP system **110** may update one or more savings markers associated with user **131**. For example, FSP system **110** may reduce the trigger conditions (e.g., remaining budget) associated with a second set of spending categories to account for user **131**'s purchase of an item that exceeded the budget for a first spending category or categories. In another example, FSP system **110** may update a savings marker when user **131** purchases an item for which the savings marker was set. For example, FSP system **110** may remove a savings marker associated with a vehicle after user **131** meets the savings marker and/or purchases a vehicle.

FIG. **5** is an exemplary retail environment, consistent with disclosed embodiments. Consistent with disclosed embodiments, one or more hubs **124** may detect that a user **131** has entered a retailer environment using in-store hub network **240** (event **505**). Hub(s) **124** may communicate the event to FSP system **110** (via, e.g., merchant server **122** over network **140**), which may perform operations further described with respect to FIG. **8**.

Hub(s) **124** may further detect that a user **131** has stood in front of a particular set of products for a predetermined amount of time (event **510**). In such an event, hub(s) **124** may determine that user **131** is considering whether or not to buy an item from the set of products and report the event to FSP system **110** consistent with disclosed embodiments along with information regarding the detected customer card and set of products. FSP system **110** may, in turn, provide user **131** with an analysis (via, e.g., client device **130**) while user **131** remains in front of the set of products. The analysis may include, for example, an indication of customer review for each product in the set of products and/or a suggestion as to which product from the set of products would best fit user **131**'s savings goals. FSP system **110** may also provide an analysis as if the user had interacted with the set of products, which may include an analysis consistent with that described with respect to FIG. **9**.

Hub(s) **124** may further detect that a user **131** has interacted with one or more store items **123** (events **515** and **520**). Hub(s) **124** may communicate the event to FSP system **110** (via, e.g., merchant server **122** over network **140**), which may perform operations further described with respect to, for example, FIG. **9**. Finally, hub(s) **124** may detect that that user **131** has crossed a threshold near the entrance/exit of the retail environment (event **530**) and cease monitoring customer card **135**. According to some embodiments, hub(s) **124** may determine that user **131** was carrying one or more store items **123** when the customer exited the retailer environment (or entered a purchasing area of the retail environment). Upon detecting event **530**, hub(s) **124** may communicate the event to FSP system **110** (via, e.g., merchant server **122** over network **140**), which may conduct a corre-

sponding financial transaction from an account of user **131** to fund the purchase of the one or more store items **123** carried out of the retailer environment by user **131**.

FIG. 6 is a diagram of an exemplary interface displaying an exemplary analysis on a client device, consistent with disclosed embodiments. FIG. 6 is a diagram of an exemplary client device **130** including an interface displaying an analysis provided by FSP system **110** consistent with disclosed embodiments. For example, client device **130** may include an interface (via, e.g., an app associated with financial service provider **110**) that includes a graphical image identifying, for example, the financial service provider offering the real-time monitoring services (area **610**), the financial service accounts registered for monitoring (area **620**), and savings goals identified by FSP system **110** and/or entered by the user (area **630**). Client device **130** may also include a message viewing area **640**, which may display a message such as, for example, those described at step **435**, **735**, **820**, and/or **930**.

FIG. 7 is a flow chart of an exemplary user profile generation process, consistent with disclosed embodiments. At step **705**, FSP system **110** may receive a request for real-time monitoring of user **131**'s spending habits (via, e.g., client device **130**). FSP system **110** may receive the request directly (via, e.g., a website submission, e-mail, etc.) or indirectly (e.g., FSP system **110** may consider the downloading of an app for real-time monitoring as a request to begin monitoring user **131**'s spending patterns). FSP system **110** may also collect information from various sources reflecting user **131**'s demographics, spending and savings patterns, communication preferences, etc. For example, at step **710**, FSP system **110** may access the financial records of user **131** at the financial service entity associated with FSP system **110**, as well as any third-party financial service entities with whom user **131** holds an account. At step **715**, FSP system **110** may access social network accounts associated with user **131** in order to, for example, collect various demographic information. In some embodiments, FSP system **110** may request and receive the necessary log in credentials from user **131** (via, e.g., client device **130**) to access the financial and social network accounts of user **131**. At step **720**, FSP system **110** may access data stores associated with client device **130**, including data stores not otherwise associated with an app for real-time monitoring (e.g., program(s) **324**), if installed. Based at least on the information collected at steps **710-720**, FSP system **110** may determine user **131**'s communication preferences (step **725**), identify user **131**'s spending patterns (step **730**), identify user **131**'s income and savings patterns (step **735**), identify user **131**'s life stage (step **740**), and/or derive any other characteristic of user **131** reflected in the accessed data. For example, FSP system **110** may determine from the accessed financial records that user **131** saves \$350 per month and takes one vacation per year that on average costs \$4,000. Thus, FSP system **110** may automatically identify savings marker(s) (see step **410**) for user **131**'s annual vacation. FSP system **110** may also determine, for example, that user **131** spends roughly \$75 at restaurants per week, pays \$150 on cable TV per month, has a \$1,750 monthly mortgage payment, etc. FSP system **110** may use this information to, for example, take into account user **131**'s typical spending patterns when providing an analysis estimating the impact of purchasing a store item on user **131**'s spending goals. FSP system **110** may further determine that user **131** prefers to communicate via certain channels, such as a social network-

ing messaging system, SMS messaging, Skype™, etc., based on usage data accessed on client device **130**, accessed social networks, etc.

At step **745**, FSP system **110** may determine whether additional information is required or desirable for generating a user profile for user **131**. If additional information is not required or desired (step **745**; NO), FSP system **110** may generate a user profile for user **131** (see step **405**). If additional information is required or desired (step **745**; YES), FSP system **110** may generate a survey (e.g., a questionnaire) requesting the information required or desired. For example, if FSP system **110** could not identify any savings markers from the accessed financial data, FSP system **110** may generate a survey (step **750**) requesting that the user **131** identify savings goals to include in the user profile of user **131**. FSP system **110** may also provide the survey (step **755**) to user **131** (via, e.g., client device **130**) and receive a response (step **760**) before generating the user profile for user **131** (see step **405**).

FIG. 8 is a flow chart of an exemplary user entering store monitoring process, consistent with disclosed embodiments. At step **805**, FSP system **110** may determine that user **131** has entered the retail environment of a merchant. For example, hub(s) **124** may detect the presence of a customer card **135** and communicate the event to FSP system **110** (via, e.g., merchant server **122** and network **140**). As discussed, hub(s) **124** may communicate with and/or track the location of customer card **135** using an in-store hub network **240** generated by the one or more hubs **124**. In-store network **240** may comprise near field communication (NFC), RFID, infrared, electric fields, magnetic fields, WiFi, Bluetooth, or any other suitable wireless technology suitable for performing operations consistent with disclosed embodiments. Hub(s) **124** may determine that user **131** has entered the store when customer card **135** enters in-store network **240**. In one example, hub(s) **124** may determine that customer card **135** has entered in-store network **240** when customer card **135** accesses the network and begins communicating with hub(s) **124**. In other examples, hub(s) **124** may generate an electrical field, and hub(s) **124** may determine customer card **135** has entered the in-store network **240** based on changes to the electrical field.

At step **810**, FSP system **110** may identify the merchant. For example, FSP system **110** may communicate with merchant server **122** regarding the event in step **805** to obtain information identifying, among other things, the merchant name, location, merchant type, inventory listings, etc. FSP system **110** may also communicate with merchant server **122** to obtain information identifying the customer card **135** detected at step **805**. FSP system **110** may then access the user profile of user **131** based on the identified customer card **135** to access, among other things, savings markers and trigger conditions associated with user **131** (step **815**).

In one embodiment, the identified user profile may include a trigger condition for entering a retailer environment. For example, user **131**'s profile may include a trigger condition for providing user **131** with a budget limit upon entering a retailer environment. Thus, consistent with disclosed embodiments, FSP system **110** may provide user **131** with a budget limit based on, in one non-limiting example, one or more savings goals of user **131** and the merchant type of the retail environment entered. For example, user **131** may enter a grocery store, and at step **820**, FSP system **110** may provide an analysis upon user **131** entering the retailer environment explaining that user **131**'s grocery budget has \$90 remaining in it until user **131**'s next budgetary period (e.g., biweekly income payment or the like).

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At step 825, FSP system 110 may access an inventory listing of the merchant associated with merchant system 120. In some embodiments, FSP system 110 may access data stores associated with merchant system 120. Additionally or alternatively, FSP system 110 may receive an inventory listing from merchant system 120 and/or store an inventory listing within the data stores of FSP system 110.

At step 830, FSP system 110 may identify merchant inventory items corresponding to savings markers of user 131. For example, FSP system 110 may determine that user 131 has a savings marker establishing a budget to make a \$200 purchase of a particular store item, that user 131 saved \$150 of the \$200 purchase, and/or that the merchant is having a sale on that particular item such that user 131 can make the purchase while in the retailer environment without impacting any other budget constraints. Thus, at step 835, FSP system 110 may provide the identified merchant inventory information to the user (via, e.g., client device 130) explaining, for example, that the merchant is having a sale within the retail environment, and that user 131 can achieve a savings goal ahead of schedule (e.g., purchase the on-sale store item ahead of the budgeted schedule without violating any monetary budgeting constraints).

FIG. 9 is a flow chart of an exemplary user monitoring process, consistent with disclosed embodiments. At step 910, FSP system 110 may detect that user 131 has picked up a store item 123. For example, FSP system 110 may receive a communication from hub(s) 124 (via, e.g., merchant server 122 and network 140) that user 131 has picked up a particular store item 123 within the retail environment. As discussed, hub(s) 124 may communicate with and/or track the location of customer card 135 and product tags 128 over an in-store hub network 240 generated by the one or more hubs 124. In some embodiments, a user 131 picking up a particular store item 123 may trigger a sensor that may alert the hub(s) 124 that the store item 123 has been picked up, to trigger the monitoring of the user 131 by hub(s) 124. In-store network 240 may comprise near field communication (NFC), RFID, infrared, electric fields, magnetic fields, WiFi, Bluetooth, or any other wireless technology suitable for performing operations consistent with disclosed embodiments. Hub(s) 124 may determine that a customer has interacted with a store item 123 when customer card 135 and a product tag 128 become linked. In one example, hub(s) 124 may determine customer card 135 and a product tags 128 are linked based on a determination that customer card 135 and product tag 128 are within a predetermined proximity of each other. For example, hub(s) 124 may determine that customer card 135 and product tag 128 are within 10 inches of each other, indicating that the user has picked up store item 123. In other examples, hub(s) 124 may generate an electrical field, and hub(s) 124 may determine customer card 135 and product tag 128 are linked based on changes to the electrical field with respect to customer card 135 and store item 123 caused by user 131 touching store item 123. Additionally or alternatively, FSP system 110 may detect that user 131 has picked up a store item 123 based on a communication from client device 130 (either directly or indirectly via, e.g., merchant server 122) indicating that user 131 operated client device 130 to scan a machine-readable code (e.g., barcode, QR code, etc.) affixed to the store item.

At step 915, FSP system 110 may identify the store item 123 picked up by user 131. For example, in some embodiments, hub(s) 124 and/or merchant server 122 may provide identifying information associated with the picked-up store item 123 when reporting the event. In other embodiments, hub(s) 124 and/or merchant server 122 may provide all

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inventory information associated with the picked-up store item 123 when reporting the event. FSP system 110 may also communicate with merchant server 122 to obtain information identifying the customer card 135 associated with the picked-up item 123. FSP system 110 may then access the user profile of user 131 based on the identified customer card 135 to access, among other things, savings markers and trigger conditions associated with user 131 (step 920).

At step 925, FSP system 110 may generate an analysis of the estimated impact purchasing the picked-up store item 123 would have on user 131's savings goals. Consistent with disclosed embodiments, the analysis may include a determination that the purchase of the picked-up store item picked up would meet a trigger condition, such as exceeding a spending limit for one or more savings markers associated with the user profile of user 131. As discussed, FSP system 110 may further generate an analysis that includes suggested alternatives to the picked up store item, including alternative store items found within the same retail environment. In one example, the analysis may include a personalized cost metaphor comparing the cost of the store item picked up by user 131 to one or more regular expenses of the user. For example, if the user interacted with a business suit listed at \$550, FSP system 110 may generate an analysis that notes the purchase of the power tool equates to three months' worth of cable TV bills. In yet another example, the analysis could include suggestions for modifying the typical spending habits of user 131 to allow user 131 to purchase the picked up store item without impacting user 131's savings goals. For example, if user 131's spending habits include attending a baseball game three times per month at a cost of \$30 per ticket, FSP system 110 may generate an analysis explaining that user 131 may skip one month's worth of baseball games in order to purchase a \$90 pair of dress shoes that would otherwise exceed a spending limit. At step 930, FSP system 110 may provide the analysis to the user as discussed above (see, e.g., step 435).

FIG. 10 is another diagram of an exemplary interface displaying an exemplary analysis on a client device, consistent with disclosed embodiments. For example, client device 130 may include an interface (via, e.g., an app associated with financial service provider 110) that includes a graphical image identifying, for example, the financial service provider offering the real-time monitoring services (area 1010), the financial service accounts has registered for monitoring (area 1020), and savings goals identified by FSP system 110 and/or entered by the user (area 1030). Client device 130 may also include a message viewing area 1040, which may display a message such as, for example, those described at step 435, 735, 820, and/or 930.

In some embodiments, two or more customer cards 135 may also become linked in the same or similar way described above with respect to the linking of customer card 135 and product tag 128. Customer cards 135 may become linked in order to, for example, add an additional level of accountability for one or both users 131 associated with the linked customer cards 135 to diligently pursue their respective savings goals. In one scenario, customer card 135a (not shown) of user 131a (not shown) may link to customer card 135b (not shown) of user 131b (not shown) when user 131a and user 131b interact with each other (e.g., shake hands, bump fists, or engage in any other behavior associated with social interaction). Once linked, customer card 135a and customer card 135b may exchange identifiers and/or hub(s) 124 may identify customer card 135a and customer card 135b in order to confirm (via, e.g., client device 130) that user 131a and user 131b wish to make a profile connection

(not shown) allowing user **131a** and user **131b** to share user profile information with one another. Shared information may be viewable (via, e.g., client device **130**) so long as a user **131** does not revoke the profile connection, regardless of whether customer cards **135** remain linked.

In some embodiments, the user profiles of user **131a** and user **131b** may include public and private profile components. Thus, upon a confirmation to share user profile information, user **131a** and user **131** may be able to access the public components of each other's user profile via, e.g., client device **130**. Private components may include, for example, financial account numbers, account access information, personal information, or any other sensitive personal and/or financial information. Public components may include savings goals, spending and savings activity, areas where user **131** wishes to improve spending/savings habits, etc. Thus, user **131a** may view (via, e.g., client device **130**) user **131b**'s progress in reaching user **131b**'s savings goals.

In some embodiments, FSP system **110** may compare the user profiles of user **131a** and user **131b** to determine similar, complementary, etc., traits between user **131a** and user **131b**. For example, FSP system **110** may determine that user **131a** may have once indulged in impulse purchases that affected user **131a**'s savings goals, but user **131a** has consistently met user **131a**'s savings goals for the past three years. In the other hand, FSP system **131** may determine that user **131b** currently engages in impulse purchases that affect user **131b**'s savings goals. Thus, based on these determinations with respect to the spending habits of user **131a** and user **131b**, FSP system **110** may establish the profile connections as a mentor/mentee profile connection. In some embodiments, FSP system **110** may notify the mentor (via, e.g., client device **130**) when, for example, the mentee has interacted with a store item that will negatively affect the mentee's savings goals, when the mentee has made timely deposits into savings, etc. FSP **110** may suggest the mentor contact the mentee to offer advice, encouragement, congratulations, etc., as the case may be.

In some embodiments, FSP system **110** may compare user profiles to determine, for example, that user **131a** and user **131b** are both saving towards a large purchase (e.g., vacations, mortgage down payment, vehicle purchase, etc.) or the same purchase. FSP system **110** may in such circumstances communicate with user **131a** and user **131b** (via, e.g., client device **130**) to facilitate user **131a** and user **131b** making savings contributions at the same time, discussing each other's progress, suggesting user **131a** and user **131b** make match contributions, etc. In some embodiments, user **131a** may contribute to the savings goal of user **131b**, and vice versa.

In still other embodiments, FSP system **110** may establish a savings goal account for user **131**. For example, the savings goal account may require a regular direct deposit and/or require the account remain locked (e.g., not available for withdraw) until the savings goal associated with the account has been reached. In some embodiments, the savings goal account may comprise a mutual fund, CD (certificate of deposit), stock, etc.

The foregoing description has been presented for purposes of illustration. It is not exhaustive and is not limited to the precise forms or embodiments disclosed. Modifications and adaptations of the embodiments will be apparent from consideration of the specification and practice of the disclosed embodiments. For example, the described implementations include hardware and software, but systems and methods consistent with the present disclosure can be implemented as hardware alone. Furthermore, although aspects of

the disclosed embodiments are described as being associated with data stored in memory and other tangible computer-readable storage mediums, one skilled in the art will appreciate that these aspects can also be stored on and executed from many types of tangible computer-readable media, such as secondary storage devices, like hard disks, floppy disks, or CD-ROM, or other forms of RAM or ROM.

Computer programs based on the written description and methods of this specification are within the skill of a software developer. The various programs or program modules can be created using a variety of programming techniques. For example, program sections or program modules can be designed in or by means of Java, C, C++, assembly language, or any such programming languages. One or more of such software sections or modules can be integrated into a computer system, computer-readable media, or existing communications software.

Moreover, while illustrative embodiments have been described herein, the scope includes any and all embodiments having equivalent elements, modifications, omissions, combinations (e.g., of aspects across various embodiments), adaptations or alterations based on the present disclosure. The elements in the claims are to be interpreted broadly based on the language employed in the claims and not limited to examples described in the present specification or during the prosecution of the application, which examples are to be construed as non-exclusive. Further, the steps of the disclosed methods can be modified in any manner, including by reordering steps or inserting or deleting steps. It is intended, therefore, that the specification and examples be considered as example only, with a true scope and spirit being indicated by the following claims and their full scope of equivalents.

What is claimed is:

1. A system configured for providing real-time monitoring of savings goals, comprising:
  - a memory storing software instructions, and
  - one or more processors configured to execute the software instructions to perform operations comprising:
    - establishing a user profile of a user on a financial service provider system, the user profile comprising:
      - at least one savings goal comprising a plurality of trigger conditions associated with the at least one savings goal, the plurality of trigger conditions including a remaining budget associated with at least one user budget that includes a regular expense of the user;
    - initiating communication between the financial service provider system and a merchant system that is in communication with an in-store hub network on the merchant system, the in-store hub network comprising a plurality of hubs physically located within a retail environment and a plurality of product tags affixed to store items within the retail environment;
    - receiving at the financial service provider system from the merchant system, a communication indicating determination that a user has entered a retail environment detected by the in-store hub network;
    - tracking the location of a customer card carried by the user via the merchant system by communication between the customer card and the in-store hub network, the customer card being a financial card;
    - receiving, at the financial service provider system from the merchant system, a communication over a secondary network indicating detection by at least one hub among the plurality of hubs of a location of the customer card and a location of a plurality of product

tags affixed to store items within the retail environment, each hub of the in-store hub network tracking a location of the customer card and product tags; receiving, at the financial service provider system from the merchant system and from the at least one hub, a communication over the secondary network indicating detection, from the in-store hub network of the location of the customer card and plurality of product tags;

determining that the customer card and the at least one product tag are within a predetermined proximity of each other based on changes to an electric field generated by the at least one hub, the changes to the electric field caused by the customer card and at least one product tag;

receiving a communication over the secondary network from the merchant system at the financial service provider system indicating that the customer card and at least one of the product tags are linked based on the determination that the customer card and the at least one product tag are within the predetermined proximity of each other;

determining by the financial service provider system that the user has interacted with a store item associated with the at least one product tag within a retail environment based on the received communication that the customer card and at least one of the product tags are linked;

accessing the user profile;

determining that a purchase of the store item would meet at least one trigger condition from among a plurality of trigger conditions by exceeding the remaining budget associated with the at least one user budget;

generating, on the financial service provider system, a real-time analysis of an estimated impact of the purchase on the at least one user budget, the analysis comprising a personalized cost metaphor, the personalized cost metaphor comparing a cost of the store item to the at least one regular expense of the user and the remaining budget, the real-time analysis including a suggested modification to a typical spending habit of the user that allows the user to purchase the store item without impacting the at least one user budget; and

providing the analysis from the financial service provider system to a client device for display to the user in real-time while the user remains within the retail environment.

2. The system of claim 1, wherein the customer card and the product tags are battery-less.

3. The system of claim 1, wherein the operations further comprise providing the real-time analysis over the secondary network to the user while the user remains within the retail environment by using at least one of a push notification, an SMS message, or an e-mail.

4. The system of claim 3, wherein the operations further comprise providing the real-time analysis over the secondary network to the client device while the user interacts with the store item.

5. The system of claim 1, wherein the operations further comprise:

determining that the user initiated a financial transaction to purchase the store item; and

updating the trigger conditions based on the determination that the user initiated the financial transaction.

6. The system of claim 5, wherein the operations further comprise sending instructions from the financial service provider system to the client device over the secondary network to update the trigger conditions by lowering the remaining budget to meet one of the at least one savings goal based on the determination that the user initiated the financial transaction.

7. The system of claim 5, wherein the operations further comprise prompting the user to add, to the user profile, an additional savings goal associated with the store item when purchase of the store item would exceed the remaining budget.

8. The system of claim 1, wherein the operations further comprise:

accessing an inventory of store items within the retail environment; and

providing the user budget to the client device based on the at least one savings goal.

9. The system of claim 1, wherein the operations further comprise:

accessing financial records of the user from the financial service provider system; and

generating the user profile on the financial service provider system based on at least the accessed financial records.

10. The system of claim 9, wherein the operations further comprise:

identifying savings practices of the user based on at least the accessed financial records;

identifying spending practices of the user based on at least the accessed financial records;

configuring the at least one savings goal of the user based on the identified savings practices and the identified spending practices; and

generating the trigger conditions associated with the at least one savings goal.

11. The system of claim 1, wherein the operations further comprise:

identifying additional information needed to generate the user profile;

providing a user profile survey to the client device requesting the additional information; and

configuring the at least one savings goal of the user based on at least a response to the user profile survey.

12. The system of claim 1, wherein the operations comprise:

accessing, by the financial service provider system, a social network account of the user; and

generating, by the financial service provider system, the user profile based on at least the accessed social network account of the user.

13. The system of claim 1, wherein the operations further comprise:

receiving, at the financial service provider system, usage data for the client device;

identifying communication preferences of the user based on at least the received usage data; and

generating, by the financial service provider system, the user profile based on at least the identified communication preferences.

14. The system of claim 13, wherein the operations further comprise providing the analysis over the secondary network to the client device according to the identified communication preferences.